EPA/540/2-89/005

SUPERFUND TREATABILITY CLEARINGHOUSE

Document Reference:

GCA Corp. "Endangerment Assessment and Feasibility Study, Picillo Site, Coventry, Rhode Island." Vol. I, III. Prepared for U.S. EPA, Office of Waste Programs Enforcement. 15 pp. March 1985.

EPA LIBRARY NUMBER:

Superfund Treatability Clearinghouse - EURK

SUPERFUND TREATABILITY CLEARINGHOUSE ABSTRACT

Treatment Process: Biological - Combined Biological

Media: Soil/generic

Document Reference: GCA Corp. "Endangerment Assessment and Feasibility Study, Picillo Site, Coventry, Rhode Island." Vol. I, III. Prepared for U.S. EPA, Office of Waste Programs Enforcement. 15 pp. March 1985.

Document Type: Contractor/Vendor Treatability Study

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Site Name: Picillo Site, RI (NPL)

Location of Test: Coventry, RI

BACKGROUND: This treatability study report consists of limited pages from a study by GCA Corp. Endangerment Assessment and Feasibility Study on the Picillo Site, Coventry, R.I. which reported on the change in contaminant concentrations in several stockpiles of soils. One stockpile containing phenol concentrations up to 870 ppm was landfarmed by spreading and irrigating the waste with microorganisms. Other stockpiles are mentioned but insufficient details are provided to determine treatment methods or results.

OPERATIONAL INFORMATION: Excavated soils were stockpiled in three impoundments. The soils in the area are mainly sand and gravel till. The largest pile (3500 cubic yards) has PCB contamination. A second stockpile (2000 cubic yards) which was contaminated with phenols was landfarmed by spreading the soil on an underdrain and liner system, and irrigating the soil. No details are provided on the microorganisms or other facts related to this irrigation.

PERFORMANCE: Concentrations of PCBs, phenols, and volatile organics were reduced by the treatment. In the large impoundment, concentrations of PCBs were decreased from approximately 700 ppm to an average of 37 ppm after 3 1/2 years by the use of landfarming. Several volatile organics were also present in this stockpile, although the concentrations were not discussed. Landfarming in the second impoundment reduced phenol concentrations from approximately 900 ppm to 70 ppm.

The limited data available does not allow the treatment performance to be accurately assessed. There is no one-to-one correspondence in the analysis of the influent and effluent concentrations. Some contaminants reported effluent concentrations greater than the influent concentrations.

There is no QA/QC information, however, a laboratory working for the state provided the analytical services.

CONTAMINANTS:

Analytical data is provided in the treatability study report. The breakdown of the contaminants by treatability group is:

Treatability Group	CAS Number	Contaminants
W09-Other Polar Organic Compounds	108-95-2	Phenol

NOTE: Quality assurance of data may not be appropriate for all uses.

980-T51-RT-EURK

GCA-TR-85-41-G

Prepared for

U.S. ENVIRONMENTAL PROTECTION AGENCY
Office of Waste Programs Enforcement
Washington, D.C.

Contract No. 68-01-6769
Work Assignment No. 83-11

EPA Work Assignment Managers
Peter McGlew, Region I
Susan Santos, Region I
Deborah Dalton, Headquarters

ENDANGERMENT ASSESSMENT AND FEASIBILITY STUDY PICILLO SITE COVENTRY, RHODE ISLAND VOLUME I

Draft Final Report

March 1985

Prepared by

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Contaminated Soil Stockpiles--

During the August 1980 remedial actions conducted at the site, a composite sample (i.e., multiple samples from an area mixed prior to analysis) of excavated soil from the northeast trench was found to contain 700 ppm PCB-1248. Based on this information and knowledge of the wastes found, the excavated soil from the northeast trench was placed in an impoundment constructed in the southeast corner of the site, referred to as the "PCB Pile." This stockpile contains approximately 3,500 cubic yards of soil contaminated with PCBs and other organic compounds. It has both a bottom and top liner. Although the bottom liner has been ruptured as a result of recent sampling activities.

Following the initial sampling of the northeast trench soil, portions of the PCB pile have been sampled on at least five occasions. In February 1984, RI DEM and EPA conducted an extensive sampling effort of the PCB pile. During this effort the pile was sectioned with a backhoe and 94 samples were collected from the pile at precise stations and depths. The collected samples were analyzed for PCBs by RI DEM and EPA. Roughly 17 percent of the samples showed PCB concentrations greater than 50 ppm and these elevated levels were not restricted to well-defined portions of the pile. The average concentration detected was 36.8 ppm and the maximum concentration detected was 180 ppm. Analyses of soils from other locations onsite indicate that PCBs are restricted to the PCB Pile.

RI DEM also collected samples for volatile organic analysis and the results indicate that 11 volatile organic compounds, including toluene and xylene, are present in the PCB pile.

During the west trench excavation activities, approximately 2,000 cubic yards of contaminated soil was stockpiled at the south end of the site adjacent to the PCB pile. This pile is termed he "2,000 yd^3 phenol pile" because it once contained high concentrations (870 ppm) of phenol. RI DEM contracted with O&H Materials to treat the phenol contaminated waste by the use of land farming (spreading and irrigation of waste with microorganisms to biodegrade phenol). As part of that treatment, an under drain and liner system was constructed which is still in place. Most recent data indicate that treatment successfully reduced phenol levels to approximately 70 ppm in the soil.

In addition to the two large soil stockpiles, there is a third pile of contaminated soils which was also generated from the west trench excavation activities. This pile, if termed the "1,000 yd^3 phenol pile" or "Phase III pile" and contains relatively low levels of volatile organics and high levels of phenols. Two soil samples from this stockpile were taken by the RI DEM in February, 1984 and analyzed for contaminants. In one sample, tetrachloroethylene and xylenes were detected at 290 and 1,080 ppb, respectively. In the other sample, ethylbenzene and xylenes were detected at 455 and 3,200 ppb, respectively. The 1,000 yd^3 phenol pile is located approximately in the center of the site. Recent sampling by RI DEM indicates the presence of high levels of phenols (3,000 ppm) and phthalates in the pile. GCA is awaiting the results of these analyses from RI DEM.

Contaminant Migration

The Picillo disposal site is situated within unconsolidated, shallow to bedrock, mineral deposits. These deposits are comprised mainly of a sand and gravel till (unstratified and unsorted glacial material deposited directly by glacial ice). Lowland areas surrounding the site contain recent swamp deposits, underlain by deposits of sand, gravel, and till. This overburden rests upon granitic gneiss bedrock which exhibits fractures in the upper few feet. The nature of the subsurface geology suggests a single aquifer (water-bearing unit).

Because of the site's location on a hillslope, contaminants introduced at the site are subject to divergent flow. A local ground water divide through the disposal area results in the development of two contaminant plumes: northwest and southwest. On a larger scale, there is a regional divide separating the Roaring Brook watershed from areas to the north, including Quidnick Reservoir (see Figure 1-4).

The migration pathways from locations within the disposal area to potential receptors include many transport media such as mineral deposits, organic deposits, and surface water bodies. Contaminant plumes emanating from the site are subject to the natural processes of dispersion, adsorption, and degradation, which act to decrease downgradient contaminant concentrations. The importance of each phenomenon depends on the specific environmental

GCA-TR-85-41-G

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EPA Work Assignment Manager
Peter McGlew, Region I
Susan Santos, Region I
Deborah Dalton, Headquarters

ENDANGERMENT ASSESSMENT AND FEASIBILITY STUDY PICILLO SITE COVENTRY, RHODE ISLAND VOLUME III

APPENDICES

Draft Final Report

March 1985

Prepared by

GCA CORPORATION
GCA/TECHNOLOGY DIVISION
Bedford, Massachusetts 01730

APPENDIX B-5

PHENOL PILE RESULTS - PRIOR TO LANDFARMING
(FROM O.H. MATERIALS REPORT JULY 9, 1982)

Approximately 1700 yd^3 of contaminated soil require treatment to render them non-hazardous. Analyses indicate that the following are constituents of the soil matrix:

Phenols	870 ppm
Ammonia Nitrogen	38 ppm.
Oil & Grease	2.2 %
pH.	6.5.
Volatile Organics (Chlorinated & Non-chlorinated)	<10 ppm.
Cyanides	<10 ppm
Heavy Metals, Pesticides,	Below detectable limits (by EPT procedure)
PCBs	Below detectable limits

APPENDIX B-6

2,000 yd^3 PHENOL PILE RESULTS

(FROM RI DEM SAMPLING 1983-1984)

R. I. Analytical Laboratories, Inc.

SPECIALISTS IN ENVIRONMENTAL ANALYSIS

231 ELM STREET
WARWICK R I 02888

PHONE (401) 467-2452

CERTIFICATE OF ANALYSIS

REPORT TO RI Dept. of Environmental Management

204 Cannon Bldg., 75 Davis St.

Providence, RI 02908

Mr. John Doo

DATE RECEIVED 6/17/83

DATE REPORTED 7/15/83

LABORATORY NO 93882

PLANT I.D. NO 8135

SAMPLE DESCRIPTION Four (4) soil samples from Picillo Hazardous Waste Site

As requested, subject samples have been analyzed by our laboratory with the following results:

PARAMETER	QUAD 1	QUAD 2	QUAD 3	QUAD 4
Percent Moisture	9.2%	8.8%	7.5%	9.3%
Total Recoverable Phenol	59 ppm	57 ppm	40 ppm	72 ppm
Phenol (Gas Chromatography Method):				
Phenol	6.5 ppm	ND	ND	ND
2,4 Dimethylphenol	4.8 ppm	2.7 ppm	2.1 ppm	9.1 ppm
4-chloro-3-methylphenol	2.3 ppm	1.6 ppm	1.8 ppm.	2.2 ppm

A list of other phenolic compounds tested for and their detection limits is attached.

Methodology:

1. Total Recoverable Phenol by MBTH Method (Method 420.3) with Distillation in accordance wtih Methods for Chemical Analysis of Water and Wastes, EPA-600/4-79-020, March 1979.
2. Phenols by gas chromatographic method in accordance with Method 604, Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater, EPA-600/4-82/057, July 1982.

SUBMITTED BY

Anthony E. Dorlotti

PHENOLS

	DETECTION LIMIT
2-Chlorophenol	0.4 ppm
2-Nitrophenol	0.4 "
Phenol	0.4 "
2,4-dimethylphenol	0.4 "
2,4-Dichlorophenol	0.4 "
2,4,6-Trichlorophenol	0.8 "
4-Chloro-3-methylphenol	1.2 "
2,4-Dinitrophenol	0.8 "
2-Methyl-4,6-dinitrophenol	1.2 "
Pentachlorophenol	1.6 "
Nitrophenol	1.6 "

Certificate of Analysis

R.I. Dept. of Environmental Management
March 13, 1984
Number 9783

PARAMETER	#10	#11
Polychlorinated Biphenyls mg/kg		
Archlor 1248	---	---
Volatile Organic Compounds µg/kg		
methylene chloride	ND	ND
1,1-dichloroethylene	ND	ND
1,1-dichloroethane	ND	ND
trans-1,2-dichloroethylene	ND	ND
chloroform	ND	ND
1,2-dichloroethane	450	ND
1,1,1-trichloroethane	ND	ND
bromodichloromethane	ND	ND
1,2-dichloropropane	ND	ND
trichloroethylene	ND	ND
1,1,2-trichloroethane	ND	ND
tetrachloroethylene	ND	ND
chlorobenzene	ND	ND
benzene	ND	ND
toluene	1,560	900
ethylbenzene	880	1,040
xylene	7,210	1,040
Limit of Detection µg/kg	295	273

Note: A list of other volatile organic compounds tested for.

Certificate of Analysis

R.I. Dept. of Environmental Management
March 13, 1984
Number 9783

PARAMETER	#10	#11
Semi-Volatile Organic Compounds (µg/l):		
Acid Extractables:		
2,4-dichlorophenol	---	---
Base/Neutral Extractables:		
1,3-dichlorobenzene	---	---
bis (2-ethylhexyl phthalate)	---	---
Pesticides/PCB's	---	---
Mass Spectral Library Search (µg/l):		
4 carene	---	---
2-ethylhexenal	---	---
demethylethylphenol	---	---
methylphenylethylphenol	---	---
dimethylbenzeneacetomide	---	---
octadecenamide	---	---
oxoocladecylpyrrolidine	---	---
phenol (total extractable) (mg/l):	172	2.6.
Characteristics of E.P. Toxicity (mg/l):		
arsenic	---	---
barium	---	---
cadmium	---	---
chromium	---	---
lead	---	---

Note: A list of other semi-volatile organic compounds tested for and their detection limits is attached.

R. I. Analytical Laboratories, Inc.

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PHONE (401) 467-2452

CERTIFICATE OF ANALYSIS

REPORT TO RI Dept. of Environmental Management
204 Cannon Bldg., 75 Davis Street
Providence, RI 02908
Attn: Mr. John Leo

DATE RECEIVED 5/03/83
DATE REPORTED 8/25/83
PURCHASE ORDER NO 95882
RIAL INV NO 8660

SAMPLE DESCRIPTION Pretilo soil (under steam pipe from chemical pile)

As requested, the above sample has been analyzed by our laboraotry with the following results:

PARAMETER	RESULTS
Volatile Organic Compounds:	
methylene chloride	15 ppb
1,1-dichloroethane	2 "
chloroform	3 "
trichloroethylene	1 "
toluene	252 "

A list of other volatile organic compounds tested for and their detection limits is attached.

Methodology: Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, U.S. EPA, SW-846, 1980.

If you have any questions regarding this work or if we may be of further assistance, please contact us.

RECEIVED

AUG 30 1983

Anthony F. Pavoni

VOLATILE ORGANIC PRIORITY POLLUTANTS

COMPOUNDS

benzene
carbon tetrachloride
chlorobenzene
1,1-dichloroethane
1,2-dichloroethane
1,1,1-trichloroethane
1,1,2-trichloroethane
1,1,2,2-tetrachloroethane
chloroethane
2-chloroethylvinyl ether
chloroform
1,1-dichloroethylene
1,2-trans-dichloroethylene
1,2-dichloropropane
1,3-dichloropropene (cis and trans)
ethylbenzene
methylene chloride
methyl chloride
methyl bromide
bromoform
dichlorobromomethane
trichlorofluoromethane
dichlorodifluoromethane
chlorodibromomethane
tetrachloroethylene
toluene
trichloroethylene
vinyl chloride

Detection limit: 5 ppb

R.I. Analytical Laboratories, Inc.

SPECIALIZING IN ENVIRONMENTAL ANALYSIS

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CERTIFICATE OF ANALYSIS

REPORT TO RI Dept. of Environmental Management
Cannon Bldg., Room 204, Davis St.
Providence, RI 02903
Attn: Mr. John Leo

DATE RECEIVED June 3, 1983
DATE REPORTED July 26, 1983
PURCHASE ORDER NO 95882
R.I.A.L. INV NO 8493

SAMPLE DESCRIPTION Water from phenol leach field (Picillo Site)

As requested, the above sample has been analyzed by our laboratory with the following results:

PARAMETER	RESULTS
Phenol	38 ppm
Volatile Organic Compounds:	
Toluene	153 ppb
Polychorinated Biphenyls (PCB's)	ND*
Pesticides:	
Chlordane	30 ppb

Notes: 1. Phenol by MBTH method
2. A list of other volatile organic compounds analyzed for and their dectection limits is attached.

If you have any questions regarding this work or if we may be of further assistance, please contact us.

*Dectection limit = 0.05 ppm

VOLATILE ORGANIC POLLUTANTS

methylene chloride
trichlorofluoromethane
1,1-dichloroethylene
1,1-dichloroethane
trans-1,2-dichloroethylene
chloroform
1,2-dichloroethane
1,1,1-trichloroethane
carbon tetrachloride
bromodichloromethane
1,2-dichloropropane
trans-1,3-dichloropropene
trichloroethylene
dibromochloromethane
cis-1,3 dichloropropene
1,1,2-trichloroethane
benzene
bromoform
tetrachloroethylene
1,1,2,2-tetrachloroethane
toluene
chlorobenzene
ethylbenzene
xylene

Detection limit: 50 ppb